In the Claims:

For the convenience of the Examiner, all pending claims are herewith presented:

Claims 1 through 26 are hereby cancelled without prejudice or disclaimer.

27.   **(NEW)** A system for selection of a reference die image for comparison with other die images comprising:

a die image comparator creating a difference image from a first die image and a second die image; and

a difference image analysis system coupled to the die image comparator, the difference image analysis system generating histogram data from the difference image and analyzing the slope of the histogram data to identify a region over which the slope of the histogram data changes that is used to determine whether the first die image and the second die image may be used as the reference die image.

28.   **(NEW)** The system of claim 27 further comprising a die imaging system coupled to the die image comparator, the die imaging system creating a digital representation of a die.

29.   **(NEW)** The system of claim 27 further comprising a die image storage system coupled to the die image comparator, the die image storage system storing data representative of the first die image and the second die image.

30.   **(NEW)** The system of claim 27 wherein the difference image analysis system comprises a slope detector determining whether the slope of a histogram changes.

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31.   **(NEW)** The system of claim 27 wherein the difference image analysis system comprises a size detector determining whether a size of the anomalous region exceeds a predetermined allowable size.

32.   **(NEW)** The system of claim 27 wherein the difference image analysis system comprises a density detector determining whether a number of anomalous regions per unit area exceeds a predetermined allowable number of anomalous regions per unit area.

33.   **(NEW)** A system for inspecting dies comprising:

a camera creating digital image data of two or more dies; and

a reference die detection system coupled to the camera, the reference die detection system analyzing slope changes in histogram data derived from the image data of two or more dies to determine the length of a region over which the slope of the histogram data changes, wherein the region is then used to determine whether the first die image and the second die image can be used as reference images for subsequent comparison with other dies on a wafer.

34.   **(NEW)** The system of claim 33 wherein the reference die detection system comprises an image comparator producing a difference image from the first die image and the second die image.

35.   **(NEW)** The system of claim 34 wherein the reference die detection system comprises a difference analyzer coupled to the image comparator and determining whether the difference image contains unacceptable features.

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36. (NEW) The system of claim 35 wherein the difference analyzer comprises a data sorter receiving brightness data associated with a plurality of pixels of the difference image and creating a histogram from the brightness data.

37. (NEW) The system of claim 36 wherein the difference analyzer comprises a slope detector coupled to the data sorter and determining whether a slope of the brightness data histogram changes as a brightness magnitude increases.

38. (NEW) The system of claim 36 wherein the difference analyzer comprises a dimension analyzer determining whether one or more dimensions of a group of pixels exceeds one or more predetermined allowable dimensions.

39. (NEW) The system of claim 36 wherein the difference analyzer comprises a density analyzer determining whether a density of two or more groups of pixels per unit area exceeds a predetermined allowable density.

40. (NEW) The system of claim 35 wherein the difference analyzer comprises a data sorter receiving image data associated with a plurality of pixels of the difference image and creating a histogram from the image data.

41. (NEW) The system of claim 40 wherein the difference analyzer comprises a slope detector determining whether a slope of the image data histogram changes as an image data magnitude increases.

42. **(NEW)** The system of claim 40 wherein the difference analyzer comprises a dimension analyzer determining whether one or more dimensions of a group of pixels per unit area exceeds one or more predetermined allowable dimensions.

43. **(NEW)** The system of claim 40 wherein the difference analyzer comprises a density analyzer determining whether a density of two or more groups of pixels per unit area exceeds a predetermined allowable density.

44. **(NEW)** A method for selecting a reference die image for subsequent comparison with other dies on the wafer comprising:

generating histogram data from a difference image created from source images;

identifying a region over which a slope of the histogram data changes; and

selecting one of the source images as the reference die image if the region does not exceed predetermined allowable criteria.

45. **(NEW)** The method of claim 44 wherein creating the difference image from source images comprises subtracting a first die image from a second die image.

46. **(NEW)** The method of claim 44 wherein identifying the region over which the slope of the histogram data changes comprises identifying the region over which the slope of the histogram data changes from negative to positive.

47. **(NEW)** The method of claim 44 wherein identifying the region over which the slope of the histogram data changes

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